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(71)Applicant : DAINIPPON PRINTING CO LTD

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(72)Inventor : UEDA KENJI
OTAKI HIROYUKI

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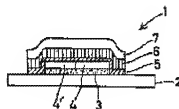
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(54) VOLUME HOLOGRAM LAMINATE AND LABEL FOR MANUFACTURE OF VOLUME HOLOGRAM LAMINATE

(57)Abstract:

PROBLEM TO BE SOLVED: To provide a hologram laminate which enables the sure destruction of a volume hologram display when a photograph is replaced or an information column is altered at the time of preventing the forgery of an identification card affixed with the photograph, the information column, etc., by discriminating whether the volume hologram display adhered onto the identification card is destroyed or not and a label for manufacture of the hologram laminate.

SOLUTION: This volume hologram laminate 1 is constituted by successively laminating a tacky adhesive layer 5 having readhesiveness, a volume hologram layer 6 and a surface protective film 7 on a base material 2 for a certificate, etc. The peeling strength at the time of peeling the laminate consisting of the volume hologram layer 6 and the surface protective film 7 from the base material 2 is made higher than the breaking strength of the laminate consisting of the volume hologram layer 6 and the surface protective film 7 or the tensile strength of 1% elongation of the laminate.



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1.This document has been translated by computer. So the translation may not reflect the original precisely.

2.**** shows the word which can not be translated.

3.In the drawings, any words are not translated.

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention]This invention on the surface of the photograph attached to an identification card, an admission ticket to an examination, a passport, etc., or an information column. It is related with the volume hologram layered product or the label for volume hologram layered product formation which can prevent ***** on purpose aiming alteration etc. at especially about the transparent volume hologram layered product containing a hologram image or the label for volume hologram layered product formation stuck for the purpose of security reservation.

[0002]

[Description of the Prior Art]In order to aim at coincidence with those who bring an identification card, and those who are written in the identification card in recent years, The art of preventing the forgery is indicated by JP,5-48215,Y, JP,5-201181,A, etc. by sticking a hologram on the photograph surface for the purpose of preventing ***** on purpose aiming at alteration etc.

[0003]the hologram containing a picture using having the function that the picture is equivalent to the stamp in the conventional identification card etc., etc., if it is in the art indicated in these gazettes, but. If it is in the latter, it is a thing to it will suppose that reproduction of a hologram image is impossible even if a hologram layer is destroyed and it re-pastes up to exfoliation of a protection film using the softness of a hologram layer for the purpose of alteration etc., and prevent forgery of a substitute [stick] of a photograph etc. by this.

[0004]However, if it is in the art especially indicated by the latter gazette, If a rigid plastic film is used as a surface protection film, It may follow in footsteps of a surface protection film, a hologram layer may exfoliate finely, traces, such as a stick substitute of a photograph and an alteration of information, may become ambiguous, and it is requested from the purpose of security reservation that the forgery preventing function should be ensured more.

[0005]

[Problem(s) to be Solved by the Invention]This invention distinguishes whether the volume hologram display body pasted up on the certificate which stuck a photograph, an information column, etc. was destroyed, and is in charge of preventing forgery of an identification card, If a photograph is stuck and changed or an information column is altered, a volume hologram display body can be destroyed certainly, and the hologram layered product which ensures forgery prevention, and this label for hologram layered product production are offered a technical problem.

[0006]

[Means for Solving the Problem]An adhesive layer to which a volume hologram layered product of this invention has a re-adhesive property on substrates, such as a certificate, Laminate a volume hologram layer and a surface protection film one by one, and peel strength at the time of exfoliating a layered product which consists of a volume hologram layer and a surface protection film from said substrate, It is characterized by being size from breaking strength in a layered product which consists of a volume hologram layer and a surface protection film, or tensile strength of the 1% elongation in this layered product.

[0007] Peel strength at the time of exfoliating a layered product which consists of a volume hologram layer and a surface protection film from the substrate (for example, photograph) in the above-mentioned volume hologram layered product, An adhesive layer which are 0.1 kg/25 mm – 5.0 kg/25 mm, and has a re-adhesive property, Breaking strength in a layered product which laminates a volume hologram layer and a surface protection film one by one, or tensile strength of the 1% elongation in this layered product is characterized by being $0.01 \text{ kg/mm}^2 - 5.0 \text{ kg/mm}^2$.

[0008] In the above-mentioned volume hologram layered product, a volume hologram layer and a surface protection film make an adhesive layer which has a re-adhesive property intervene, and are laminated.

[0009] A volume hologram layered product to which the surface protection film surface is characterized by performing hard court processing in the above-mentioned volume hologram layered product.

[0010] In the above-mentioned volume hologram layered product, releasing treatment is performed for the surface protection film surface.

[0011] It is a label for production of the above-mentioned volume hologram layered product, and is characterized by being that by which an adhesive layer which has a re-adhesive property on a releasing paper, a volume hologram layer, and a surface protection film are laminated one by one, exfoliate this releasing paper, and are stuck on substrates, such as a certificate.

[0012] Peel strength at the time of being a label for production of the above-mentioned volume hologram layered product, and exfoliating from a substrate a layered product which consists of a volume hologram layer and a surface protection film, An adhesive layer which are 0.1 kg/25 mm – 5.0 kg/25 mm, and has a re-adhesive property, Breaking strength in a layered product which laminates a volume hologram layer and a surface protection film one by one, or tensile strength of the 1% elongation in this layered product is characterized by being $0.01 \text{ kg/mm}^2 - 5.0 \text{ kg/mm}^2$.

[0013] It is a label for production of the above-mentioned volume hologram layered product, and a volume hologram layer and a surface protection film make an adhesive layer which has a re-adhesive property intervene, and are laminated.

[0014] It is a label for production of the above-mentioned volume hologram layered product, and hard court processing is performed for the surface protection film surface.

[0015] It is a label for production of the above-mentioned volume hologram layered product, and releasing treatment is performed for the surface protection film surface.

[0016]

[Embodiment of the Invention] About the volume hologram layered product of this invention, the front view is shown in drawing 1, and the sectional view in the A-A line of drawing 1 is shown in drawing 2.

[0017] As for a volume hologram layered product, the adhesive layer for which substrates, such as a certificate, and 3 have a photograph and a paste for information column attachment, as for 4, a mug shot and 4' have an information column, and 5 has a re-adhesive property 2, and 6, a surface protection film and 8 are personal information a volume hologram layer and 7 one among a figure.

[0018] Although the volume hologram layered product 1 in this invention illustrates an admission ticket to an examination to drawing 1, the personal information 8, such as a name and an examinee's number, is filled in, and the mug shot 4 and information column 4' are stuck. Information column 4' is entry columns, such as a proof matter about the person who brings the certificate, and is stuck with seal shape like a photograph. This mug shot 4 and information column 4' are stuck on a substrate, and the volume hologram layer 6 and the surface protection film 7 are laminated via the adhesive layer which has a re-adhesive property on it. Hologram images, such as a school name and a school badge, are recorded on this volume hologram layer by the interference fringe corresponding to a hologram interference pattern, for example.

[0019] Next, the lamination of the volume hologram layered product of drawing 1 is explained based on drawing 2 which is an A-A line sectional view of drawing 1.

[0020]The volume hologram layered product of this invention so that the mug shot 4 and information column 4' may be stuck via the paste 3 for photograph attachment on the substrate 2 and this substrate 2 and the mug shot 4, and information column 4' may be straddled, The volume hologram layered product 6 and the surface protection film 7 are laminated one by one via the adhesive layer 5 which has a re-adhesive property.

[0021]As the substrate 2, the film and sheet which consist of paper, a synthetic paper, a synthetic resin, or metal can be used, and various gestalten, such as a sheet shaped like an admission ticket to an examination as shown in drawing 1, the shape of a card type like an ID card, and a booklet like a passport, can be taken. Even if the paste 3 for attachment tends to exfoliate from a substrate a volume hologram layered product and the layered product which consists of surface protection films, it has the adhesive strength which cannot exfoliate neither the photograph 4 nor information column 4' from the substrate 3, and a common starch paste and a synthetic paste are just used for it.

[0022]It is not necessary to be the picture which should just use the publicly known photographic materials which make a silver salt representation, a sublimation transfer image, etc. as the mug shot 4, and not necessarily copied the face, and may be a picture which displays the portion which can specify individuals, such as a fingerprint and palm print. As information column 4', when the certificate is certificates, such as a sports meet, a number, a character, etc. are displayed by printing, the monochrome by an ink jet, or the colored presentation, and information column 4' can display the postscript matter according whether you are the hall name and a player to the qualification display of affiliation etc., and also a sponsor etc.

[0023]The adhesive layer 5 which has a re-adhesive property, for example An acrylic resin, acrylic ester resin, Or these copolymers, a styrene butadiene copolymer, crude rubber, Casein, gelatin, rosin ester, terpene resin, phenol system resin, Styrene resin, chroman indene resin, polyvinyl ether, silicone resin, etc. are illustrated, and an alpha cyanoacrylate system, a silicone series, a maleimide system, a styrol system, a polyolefin system, a resorcinol system, and polyvinyl ether system adhesives are illustrated. As thickness of these adhesive layers, 4 micrometers/20 micrometers are preferred.

[0024]After the volume hologram layer 6 applies a volume hologram recording material on a base film, the interference fringe equivalent to the wave front of the light from an object is what was recorded in the layer in the form of transmissivity abnormal conditions and refractive index modulation. Even if it faces a duplicate, it is easily producible by sticking the volume hologram original edition and carrying out exposure development. As a recording material, publicly known volume hologram recording materials, such as silver salt material, a dichromated gelatin emulsion, photopolymerization nature resin, and a photocrosslinkable resin, are mentioned. As thickness of this volume hologram layer, 0.1 micrometer - 50 micrometers are 5-20 micrometers preferably.

[0025]The surface protection film 7 Next, a polyethylene film, a polypropylene film, A polyfluoroethylene system film, a polyvinylidene fluoride film, a polyvinylchloride film, A polyvinylidene chloride film, an ethylene-vinyl alcohol film, A polyvinyl alcohol film, a polymethylmethacrylate film, A polyether sulfon film, a polyether ether ketone film, A polyamide film, a tetrafluoroethylene perfluoroalkyl vinyl ether copolymerization film, a polyethylene terephthalate film, a polyimide film, etc. are illustrated, and 2 micrometers - 200 micrometers are 10 micrometers - 50 micrometers preferably as thickness of a protection film.

[0026]Although a graphic display is not carried out, on the surface protection film 7, it is the purpose of improving the protection nature of the surface protection film 7 surface, and it is good to perform hard court processing if needed. Hard court processing a silicone series, a fluorine-containing silicone series, a melamine alkyd system, a urethane acrylate system (ultraviolet curing type), etc., for example by dipping spreading, spray coating, and the roll coat applying method. It is [1 micrometer - 50 micrometers of after-desiccation thickness] good to apply to 3 micrometers - 25 micrometers preferably.

[0027]Similarly, although not illustrated, in order to prevent sticking a rigid high film on the surface protection film 7 surface or a hard court treated surface when forging, and exfoliating, it is desirable to perform releasing treatment. Releasing treatment is good to perform a fluorine system release agent, a silicone series release agent, a stearate system release agent, a wax

system release agent, etc. by dipping spreading, spray coating, and the roll coat applying method.

[0028]The volume hologram layered product of this invention aims at destroying a volume hologram layer certainly, if it is going to exfoliate a surface protection film etc., for example for forgery prevention, such as a stick substitute of a photograph etc., in the above-mentioned lamination. For that purpose, first, when the peel strength between the volume hologram layer 6 and the surface protection film 7 is weak. If the surface protection film 7 is exfoliated, even if a volume hologram layer tends to be exposed and it is going to exchange a photograph, generally the volume hologram layer 6, Since are an acrylic resin, gelatin, etc., and it is vulnerable, and is destroyed immediately and the component makes forgery impossible, it is satisfactory. but when the peel strength between the volume hologram layer 6 and the surface protection film 7 is strong, a volume hologram layer will follow in footsteps of exfoliation [a surface protection film], and will exfoliate.

[0029]When a surface protection film contains a plasticizer, as shown in drawing 3, can provide 5" of adhesive layers between the surface protection film 7 and the volume hologram layer 6, but. Also when the adhesive strength by 5" of adhesive layers becomes higher than the adhesive strength by adhesive layer 5', similarly, a volume hologram layer will follow in footsteps of exfoliation [a surface protection film], and will exfoliate.

[0030]The layered product of the substrate 2 shown in drawing 2 in the volume hologram layered product of this invention to adhesive layer 5 / volume hologram layer 6 / surface protection film 7, 5" of adhesive layer 5' / volume hologram layer 6 / adhesive layers from the substrate 2 shown in drawing 3 Or the layered product of the /surface protection film 7. It is needed from breaking strength [in / in the peel strength at the time of exfoliating (it is only hereafter called the exfoliating layered product) / these layered products], or the tensile strength of the 1% elongation in these layered products that it is size.

[0031]The peel strength (kg/25mm) of the layered product from a substrate is measured by the 180-degree friction test [made in Imano Factory and form SV-201-E **** compression testing machine] specified by JIS Z0237. The measuring condition is as follows.

[0032]

Measuring atmospheres ; 20 ** x 65%RH specimen ; 25mm width pasting ; It is sticking-by-pressure pasting time by the platen 1 round trip of two kg. ; Exfoliation angle after [of lamination] 60 minutes ; 180" exfoliation speed ; In 250 mm/min this invention, it is good to set peel strength of a layered product to 1 kg/25 mm - 3 kg/25 mm preferably kg/25 0.1 mm - 5.0kg/25 mm. If the peel strength of a layered product is lower than 0.1 kg/25 mm, it cannot but use what runs short of the intensity as a layered product covered with relations, such as breaking strength in the layered product mentioned later, on a photograph, and is not practical. The maximum of the adhesive strength of a binder which has a re-adhesive property made 5.0 kg/25 mm the maximum.

[0033]In the volume hologram layered product of this invention, when exfoliating a layered product from a substrate, it needs that they are whether this layered product fractures and a thing elongated 1% or more. The breaking strength of the exfoliating layered product or the tensile strength of 1% elongation is measured according to regulation of JIS K7127-1989 made in Imano Factory and by a form SV-201-E **** compression testing machine. The measuring condition is as follows.

[0034]

Measuring atmospheres ; 25 **, RH50% specimen ; 25mm width speed of testing ; In the volume hologram layered product of 200 mm/min this invention, So that an arrow may illustrate the direction of hauling to drawing 4 and the rupture condition may be illustrated, So that an arrow may illustrate the direction of hauling to drawing 5 and the expanded state may be illustrated, the breaking strength of the exfoliating layered product, or the tensile strength of 1% elongation — $0.01\text{kg}/\text{mm}]^2 - 5\text{kg}/\text{mm}]^2$ — it is a thing of $0.03\text{kg}/\text{mm}]^2 - 3\text{kg}/\text{mm}]^2$ preferably. If breaking strength or the tensile strength of 1% elongation is lower than $0.01\text{kg}/\text{mm}]^2$, If the exfoliating layered product is too vulnerable, and the intensity as a layered product laminated on

a photograph runs short and maximum $5.0\text{kg}/\text{mm}^2$ is exceeded, a volume hologram layer will follow in footsteps with exfoliation of a surface protection film, and destruction of a volume hologram layer cannot be performed with a positive thing.

[0035]Namely, in the volume hologram layered product of this invention, The peel strength at the time of exfoliating from a substrate the layered product which consists of a volume hologram layer and a surface protection film, The adhesive layer which are $0.1\text{ kg}/25\text{ mm} - 5.0\text{ kg}/25\text{ mm}$, and has a re-adhesive property. The breaking strength in the layered product which laminates a volume hologram layer and a surface protection film one by one, or the tensile strength of the 1% elongation in this layered product is $0.01\text{kg}/\text{mm}^2 - 5.0\text{kg}/\text{mm}^2$, And the peel strength at the time of exfoliating from a substrate the layered product which consists of a volume hologram layer and a surface protection film, It is size from the breaking strength in the layered product which consists of a volume hologram layer and a surface protection film, or the tensile strength of the 1% elongation in this layered product, When exfoliating from a substrate the layered product which consists of a volume hologram layer and a surface protection film, this layered product fractures, or it is extended 1% or more, and hologram recording is destroyed. Namely, either the breaking strength in the exfoliating layered product or the tensile strength of 1% elongation should just be contained within the limits of it.

[0036]Since each of adhesive layers in a layered product and volume hologram layers is elasticity very much, it depends for the breaking strength of a layered product, or the tensile strength of 1% elongation on the breaking strength of the surface protection film 7, or the tensile strength of 1% elongation. Therefore, it is good to refer to breaking strength of a surface protection film, or tensile strength of 1% elongation when designing a layered product.

[0037]As the surface protection film 7, in the surface protection film mentioned above, by a relation with peel strength A polyethylene film (PE), A polypropylene film (PP) ethylene-vinyl alcohol copolymerization film (EVOH), A polyvinyl alcohol film (PVA), a polymethylmethacrylate film (PMMA), A polyether sulfon film (PES), a polyamide film (nylon film), A tetrafluoroethylene perfluoroalkyl vinyl ether copolymerization film (PFA) etc. are preferred, and the exfoliating layered product can be made into the desirable breaking strength or the thing of the range of the tensile strength of 1% elongation.

[0038]Although the tensile strength (kg/mm^2) of the breaking strength (kg/mm^2) and 1% elongation is illustrated to the following table 1 by reference about these plastic films, it is somewhat different in value [the] by an extension degree. General formula data is referred to if needed. MD is a value in the length direction of a film among front, and TD is a value in the cross direction. The value of a polyimide film with high breaking strength or tensile strength of 1% elongation (PI), a polyethylene terephthalate film (PET), and a polyether ether ketone film is also simultaneously shown in a table as a reference example.

[0039]

[Table 1]

	破断強度	1 %伸びの引っ張り強さ
PE	MD: 2.14, TD: 2.05	—
PP	MD: 5.0, TD: 2.5	MD: 0.05, TD: 0.5
EVOH	MD: 9.0, TD: 4.0	MD: 2.2, TD: 2.2
PVA	MD: 5.5, TD: 5.5	MD: 0.25, TD: 0.25
PMMA	3.0	1.2
PES	8.5	2.2
ナイロン	MD: 22, TD: 28	MD: 1.6, TD: 1.1
PFA	MD: 4.0, TD: 3.5	MD: 0.49, TD: 0.47
PI	17.6	3.0
PET	MD: 20, TD: 22	MD: 4.0, TD: 4.1
PEEK	13	3.0

[0040]Next, drawing 6 (a) and (b) explains the lamination of the section about the label which is used in producing the volume hologram layered product of this invention.

[0041]The label for volume hologram layered product production and 11 are releasing papers ten among a figure, and drawing 2, drawing 3, and identical codes show an identical content.

[0042]The label shown in drawing 6 (a) the label 10 for volume hologram layered product production. The adhesive layer 5 in which re-adhesion is possible, the volume hologram layer 6, and the surface protection film 7 are laminated on the releasing paper 11, hard court processing may be carried out by necessity and releasing treatment of the surface protection film surface may be carried out further.

[0043]As the releasing paper 11, the polyethylene terephthalate film surface A fluorine system release agent. It is good to use what carried out releasing treatment with the silicone series release agent, and after exfoliating this releasing paper, it laminates from that adhesive layer 5 side on the substrate 2 which stuck the photograph etc., and the volume hologram layered product shown in drawing 2 is produced.

[0044]Adhesive layer 5' which the label shown in drawing 6 (b) can re-paste up on the releasing paper 11 top. Laminate the surface protection film 7 and the volume hologram layer 6 and 5' of adhesive layers the surface protection film surface. Hard court processing is carried out by necessity, further, after carrying out releasing treatment and exfoliating a releasing paper, it laminates from the adhesive layer 5' side on the substrate 2 which stuck the photograph etc., and the volume hologram layered product shown in drawing 3 is produced.

[0045]

[Example]Hereafter, an example explains this invention.

(Example 1)

(Production of a hologram recording material) The Lippman-type hologram was recorded on the hologram recording medium which laminated the hologram recording material layer (20 micrometers of thickness, homme NIDEKKUSU 706; made by Du Pont), and the polyvinylchloride film one by one on the polyethylene terephthalate film.

[0046](Production of a silicone separator / adhesive layer) What applied the binder (NISSETSU PE-118; made by a Japanese carbide company) by 10 micrometers of dry membrane thickness on the silicone separator (50 micrometers of thickness, SP-PET; made by Tokyo Serofan Co., Ltd.) was prepared.

[0047](Production of a surface protection film / adhesive layer / silicone separator) Silicone separator (50 micrometers of thickness) SP-PET; the binder (NISSETSU PE-118; made by a Japanese carbide company) was applied to the top by Tokyo Serofan Co., Ltd. by 10 micrometers of dry membrane thickness, and the unextended ethylene vinyl alcohol copolymerization film (thickness; made by 12 micrometer:Eval EF-F; Kuraray Co., Ltd.) was laminated in the binder side.

[0048]The releasing treatment of the ethylene vinyl alcohol copolymerization film surface carried out spray coating of the fluorine system release agent (mold spot K681; made by Asahi Glass Co., Ltd.), and was performed.

[0049](Production of the label for volume hologram layered product production) The silicone separator / adhesive layer which exfoliated and obtained above the polyvinylchloride film of the hologram recording material obtained above were laminated, and it was considered as the layered product of a PET film / hologram layer / adhesive layer / silicone separator.

[0050]Exfoliate the PET film of this layered product, and the silicone separator of the surface protection film / adhesive layer / silicone separator obtained above is exfoliated. Both were laminated and the label for volume hologram layered product production of this invention which consists of a surface protection film / adhesive layer / hologram layer / an adhesive layer / a silicone separator was obtained.

[0051]When breaking strength was measured about the layered product which exfoliated the silicone separator in this label according to regulation of JISK7127-1989, they were $MD=10\text{kg} [/\text{mm}]^2$ and $TD=5.2\text{kg} [/\text{mm}]^2$.

[0052]The place measured similarly because of reference of the unextended ethylene vinyl alcohol copolymerization film (thickness; made by 12 micrometer:Eval EF-F; Kuraray Co., Ltd.) used as a surface protection film, The breaking strength was $MD=8.7\text{kg}/[\text{mm}]^2$ and $TD=4.1\text{kg}/[\text{mm}]^2$.

[0053](Production of a volume hologram layered product) After exfoliating the silicone separator of the label obtained above, it laminated on the photograph and the information column substrate from the adhesive layer side. After laminating and neglecting it for 24 hours, the layered product which consists of a surface protection film/a volume hologram layer was tried in order to exfoliate, but the surface protection film fractured and it was checked at that time that the volume hologram layer had also been destroyed.

[0054](Measurement of peel strength) It replaces with the above-mentioned surface protection film / adhesive layer / silicone separator, On a silicone separator (50 micrometers of thickness, SP-PET; made by Tokyo Serofan Co., Ltd.), A binder (NISSETSU PE-118; made by a Japanese carbide company) is applied by 10 micrometers of dry membrane thickness, The easily-adhesive polyester film (50 micrometers of thickness, HP-7, Teijin, Ltd. make) was laminated in the binder side, and the label for volume hologram layered product production was produced like the above except having used what carried out releasing treatment to the surface like Example 1 further.

[0055]After exfoliating the silicone separator in this label, it laminated on the photograph and the information column substrate. After laminating and neglecting it for 24 hours, when peel strength was measured by the 180-degree friction test specified by JISZ0237, the peel strength was 3.1 kg/25 mm. The volume hologram layer followed in footsteps of a PET film, and exfoliated.

[0056](Example 2) It replaces with the surface protection film / adhesive layer / silicone separator in Example 1, On a silicone separator (50 micrometers of thickness, SP-PET; made by Tokyo Serofan Co., Ltd.), A binder (NISSETSU KP-981; made by a Japanese carbide company) is applied by 10 micrometers of dry membrane thickness, The non-stretched polypropylene film (thickness; 50 micrometer:toe cello CP-SC, Tokyo Serofan Co., Ltd. make) was laminated in the binder side, and the label for volume hologram layered product production was produced like Example 1 except having used what carried out releasing treatment like the surface further.

[0057]When the tensile strength of elongation was measured that 1% about the layered product which exfoliated the silicone separator in this label according to regulation of JISK7127-1989, it was $MD=0.78\text{kg}/[\text{mm}]^2$. When measured similarly because of reference of the non-stretched polypropylene film (thickness; made by 50 micrometer:toe cello CP-SC Tokyo Serofan Co., Ltd.) used as a surface protection film, the tensile strength of the 1% elongation was $0.11\text{kg}/[\text{mm}]^2$.

[0058](Production of a volume hologram layered product) After exfoliating the silicone separator of the label obtained above, it laminated on the photograph and the information column substrate from the adhesive layer side. After laminating and neglecting it for 24 hours, the layered product which consists of a surface protection film/a volume hologram layer was tried in order to exfoliate, but it checked that the surface protection film was extended, the volume hologram layer was also extended at that time, and reproducing of the hologram had become impossible.

[0059](Example 3) It replaces with the surface protection film / adhesive layer / silicone separator in Example 1, On a silicone separator (50 micrometers of thickness, SP-PET; made by Tokyo Serofan Co., Ltd.), A binder (NISSETSU PE-118; made by a Japanese carbide company) is applied by 10 micrometers of dry membrane thickness, It extruded to the binder side, the polyvinylchloride film (thickness; made by 50 micrometer:Riken Vinyl Industry) was laminated, and the label for volume hologram layered product production was produced like Example 1 except having used what carried out releasing treatment for the surface like Example 1 further.

[0060]When the tensile strength of elongation was measured that 1% about the layered product which exfoliated the silicone separator in this label according to regulation of JISK7127-1989, it was $0.11\text{kg}/[\text{mm}]^2$. When measured similarly because of reference of the extrusion polyvinylchloride film (thickness; made by 50 micrometer:Riken Vinyl Industry) used as a surface protection film, the tensile strength of the 1% elongation was $0.03\text{kg}/[\text{mm}]^2$.

[0061](Production of a volume hologram layered product) After exfoliating the silicone separator

of the label obtained above, it laminated on the photograph and the information column substrate from the adhesive layer side. After laminating and neglecting it for 24 hours, the layered product which consists of a surface protection film/a volume hologram layer was tried in order to exfoliate, but it checked that the surface protection film was extended, the volume hologram layer was also extended at that time, and reproducing of the hologram had become impossible.

[0062](Comparative example 1) It replaces with the surface protection film / adhesive layer / silicone separator in Example 1. On a silicone separator (50 micrometers of thickness, SP-PET; made by Tokyo Serofan Co., Ltd.), A binder (NISSETSU PE-118; made by a Japanese carbide company) is applied by 10 micrometers of dry membrane thickness. The easily-adhesive polyester film (50 micrometers of thickness, HP-7, Teijin, Ltd. make) was laminated in the binder side, and the label for volume hologram layered product production was produced like Example 1 except having used what carried out releasing treatment to the surface like Example 1 further.

[0063]When that breaking strength was measured about the layered product which exfoliated the silicone separator in this label according to regulation of JISK7127-1989, it was $21.9\text{kg}/\text{mm}^2$. When measured similarly because of reference of the easily-adhesive polyester film (50 micrometers of thickness, HP-7, Teijin, Ltd. make) used as a surface protection film, the breaking strength was $21\text{kg}/\text{mm}^2$.

[0064](Production of a volume hologram layered product) After exfoliating the silicone separator of the label obtained above, it laminated on the photograph and the information column substrate from the adhesive layer side. After laminating and neglecting it for 24 hours, tried the layered product which consists of a surface protection film/a volume hologram layer in order to exfoliate, but. Although it is hard to exfoliate from the adhesive layer interface by the side of a photograph for the rigidity of a surface protection film, it was able to be made to exfoliate barely, but it was able to be made to exfoliate, while there has been no serious damage in a hologram layer.

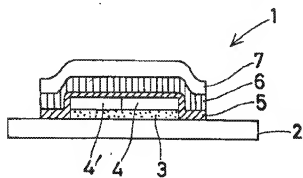
[0065]

[Effect of the Invention]If the volume hologram layered product of this invention sticks a photograph, and changes or an information column is altered, it can destroy a volume hologram display body certainly and will ensure forgery prevention.

The label for volume hologram layered product production can produce a volume hologram layered product easily.

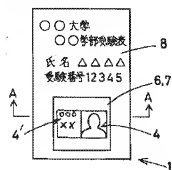
[Translation done.]

Drawing selection Representative drawing



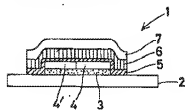
[Translation done.]

Drawing selection Drawing 1



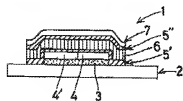
[Translation done.]

Drawing selection Drawing 2



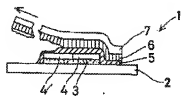
[Translation done.]

Drawing selection Drawing 3



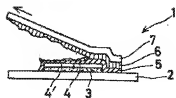
[Translation done.]

Drawing selection Drawing 4



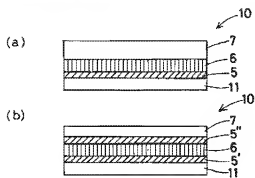
[Translation done.]

Drawing selection Drawing 5



[Translation done.]

Drawing selection Drawing 6



[Translation done.]